Junior Solar Sprint

Host Guide Book

Revised January 15, 1997

Introduction

Welcome to the exciting world of the Junior Solar Sprint! You have taken on a fun, exciting program that captures the imaginations and creativity of young people, while providing an opportunity for volunteers to share their skills and ideas. There may be some headaches along the way (especially if the sun doesn't shine), but the result will be a great sense of accomplishment. The feedback you will receive from the students, teacher/mentors, and volunteers that participate in this program will make all your hard work worthwhile.

This guide is written as just that - a guide. It will tell you what to expect from the National Renewable Energy Laboratory (NREL), as managers of the Sprint, as well as give you insights for planning and executing a successful Sprint event. The appendices are the last portion of the Guide. You will find samples of letters, forms, and materials that have been used in previous years at various Host Sites. You may want to use this information for your Sprint, or create new documents. Should you choose to copy what is in the Host Guide, remember to update your letters, forms, and materials with the information that is pertinent to your Junior Solar Sprint competition. If you have something that works for you, please send us a copy. We'd love to share it with the other Host Sites!

And please note, support is just a phone call away. By dialing 1-800-NEW-ENGY (639-3649), 8 am to 5 pm Mountain Time, you will reach the Education Programs Office at NREL. If no one answers, please leave a message and we will return your call as quickly as possible.

We look forward to your participation in the Junior Solar Sprint. Have fun!

Common Questions About the Junior Solar Sprint

What is the Junior Solar Sprint?

The Junior Solar Sprint is a classroom-based national competition of solar-powered model cars for 6th, 7th and 8th grade students. The best cars from each school compete in a regional competition. A regional competition can consist of a state, school district(s), county(ies), or part of a state (i.e., Southern California). The Sprint is not meant to be a single school activity. All participants work with identical solar panels and motors. Cars are judged on the basis of design and craftsmanship as well as performance.

What is the purpose of the Junior Solar Sprint?

The Junior Solar Sprint is more than just winning a race. It helps to teach principles of renewable energy in an atmosphere that is fun and exciting. Experience from events in previous years demonstrates that it meets its goals of stimulating interest in new technology among young students and encourages them to accept these technologies and incorporate this area in their education, consumer practices and career plans.

Who runs the Junior Solar Sprint?

The Junior Solar Sprint is supported by the U.S. Department of Energy (DOE) and Midwest Research Institute (MRI) and managed by the National Renewable Energy Laboratory (NREL).

What is a "Host Site?"

A Host Site is the organization/person that plans and organizes a regional Junior Solar Sprint competition. The Host Site responsibilities are inviting schools to participate, ordering and distributing the kits and materials, finding sponsors, managing accounts payable/accounts receivable, recruiting and training technical as well as race day volunteers, scheduling, and managing race day.

What will I receive from the manager of the Sprint?

NREL will provide you with Junior Solar Sprint kits (consisting of a solar panel and motor); written Teacher/Mentor, Student, and Host Guides; race rules; IBM or Macintosh software "Welcome to the Junior Solar Sprint"; sponsor decals for the cars; an informational brochure; promotional video; and toll-free support for any question you may have about the Junior Solar Sprint.

When is a Junior Solar Sprint competition successful?

A Sprint is successful when the students, teachers, parents, and volunteers have fun and learn about renewable energy applications. You will know people had fun when they are enthusiastically discussing next year's race immediately following the awards ceremony. The key to having a successful race is **organization.** The success of the event is directly proportional to the time and effort expended organizing the race.

HOST SITE ACTIVITIES TIMELINES

Please remember, these are guidelines, not absolutes. Once you get a feel for what needs to be done, you will be able to judge for yourself how much time you will need to accomplish the tasks at hand. And don't forget to have fun!

September

You will receive a letter from the manager of the Sprint informing you of next year's plans and asking you to return a commitment letter with an estimate of how many kits you will need for your competition.

October/November

Inviting schools
Contact your State Department of Education representatives. They may have mailing addresses and labels you can use to invite the schools with 6th, 7th and 8th grade classes. In addition, ask the Department of Education who the president of your state's science teachers' association is. Contact the president and ask for the editor of the science teachers' newsletter. Call the editor for addresses/contacts; also ask if their publication schedule is timely for your Sprint competition. If so, put an advertisement or article in the newsletter.

Create a cover letter or flyer with an application form that introduces the Junior Solar Sprint. Avoid the temptation to include all your Sprint information in the mailing. You want this first mailing to be informative, simple, and concise, not a bulky package that winds up in the circular file. Decide if you are going to limit the number of kits that go to a school or if you are going to let them order as many as they want. This information needs to be clear in your initial mailing and the order form that the teachers will complete. (Appendix A - Sample letter to schools with order form)

Accounting
Set up your accounting files. Record the contact names and schools with the number of kits ordered. Enter dollars due and dollars paid. Some sites charge a registration fee to the schools or charge above the kit cost to cover administrative expenses. You are responsible for collecting monies from the schools/students participating in your Sprint. We are responsible for collecting monies from you as the Host Site. Checks should be made payable to the Midwest Research Institute - National Renewable Energy Laboratory, and mailed to: Education Office, NREL, 1617 Cole Boulevard, Golden, CO. 80401-3393.

Planning Committee
You may want to form a Planning Committee to help you with the execution of the Sprint. The Planning Committee would make decisions and schedule parts of the

events such as location of the competition; date of the Sprint; what type of track to use; how many volunteers to use; lunch vs. concessions; photography; public relations; and many other details. If you do not work with a Planning Committee, I strongly suggest enlisting the help of a volunteer coordinator. The coordinator will recruit, schedule, and train your technical and race-day volunteers.

Sponsors
Obtain sponsors for your competition. Sponsors can cover the costs of lunches, t-shirts, awards, printing, race track materials, scoreboard, and help offset other costs of the competition. Remember to get a camera-ready logo from your sponsor for use on the banner, race-day program, and t-shirts. Write thank you letters at the time sponsors give you cash or in-kind donations. (Appendix B - Sample Sponsor Letter)

Select a Race Date and Rain Date
Select a race date and a rain date for late May or early June. Consider the weather in your area. Contact your State Department of Education for information on local school and athletic schedules that may conflict.

Site of Sprint competition
Choose a site that meets this criteria: Hard flat racing surface at least 20 meters by 10 meters with a wide area around the perimeter for race officials and spectators; the site must have 6 to 8 hours of sun with no shady areas; easy access; work areas for students and inspection of cars; parking; eating; restrooms; and the awards ceremony. Visit the race location at the same time of day as the race in order to inspect for shadows, remembering that they will be different in the spring than in the fall. Sites that have been used for competitions: Running tracks, basketball and tennis courts with adjacent grandstands; the top level of a parking garage; parking lots; and open space on college campuses.

December

Provide NREL with the following information: number of kits and extra motors needed.

Mentors for schools
Recruit technical volunteers that will answer questions for the teachers and students and visit the schools during the construction phase. Suggestions for volunteers: your business; local engineering societies such as Society of Automotive Engineers, American Society of Mechanical Engineers, Society of Women Engineers, Society of Hispanic Professional Engineers, etc.; the engineering departments of your local community colleges and universities. If you cannot recruit technical volunteers, you may refer teachers to the 1-800-NEW-ENGY number for help. **Public Relations Plan**
You need a plan to ensure adequate press coverage for the race competition. Your packet should include a press release, fact sheet, and photograph/video. Collect names and addresses for the local newspapers of the participants, and don't forget the

small towns of your participants. Look for human interest stories. (Appendix C - Sample Press Release)

January

Delivery of kits and materials
Expect delivery of the Sprint kits and other materials from NREL.

Distribute kits and materials
Distribute solar kits and materials. Consider holding an orientation meeting for the distribution of the kits. This will serve two purposes: 1) to provide technical guidance to the teachers and 2) to save you postage charges.

Set up times to visit the participating schools beginning in February. Find out the best time to contact the teacher. Do you need to get a home phone number? If you have a large base of volunteers, assign a volunteer to each school for technical support. Our past evaluations have indicated that it is very important to stay in contact with the teachers/students/schools working with this project in case they become discouraged in the process.

Plan the race track using the information provided.(See Track Specifications)

Draft an agenda for race day. (Appendix D)

Lunch
Decide whether or not to provide lunch or concessions during the competition. Questions to ask: Do you want to provide lunch? How long will the competition last? Consider your race location, can participants reach restaurants in a timely manner? Are there picnic tables for participants that bring their own lunches and coolers? Can you raise the money to provide lunch/concessions? Will a sponsor provide lunch?

February

Decide on the timing device. Stop watches? Lane judges?

Begin phone contacts and visits to the participating schools.

Plan your scoreboard, signs, banners, etc. You may want to contact your local vocational technology schools to complete this work. Students work on the graphic design in class; you pay for the supplies. (Remember the logos from your sponsors.) Design and order t-shirts, if appropriate. (Remember to include the logos of all your sponsors!)

Schedule and map out race day. This will be the basis for your race day program.

Plan the times and places for registration for teams and volunteers, inspection, design, race track, the race announcer, public address system, work areas, lunch and eating areas, and the awards ceremony. Calculate the number of volunteers you will need on race day. Decide whom you want to ask to be the moderator and award presenter(s). Who is vivacious and has a good speaking voice? Someone from your office? Local press or celebrity? Invite them to participate.

March

Keep contacting the schools! Evaluations have found that more teams showed up on race day when someone (the technical mentor or someone from the host site) kept in touch with them to see how they were doing and if they needed any questions answered.

Verify that the race site is still available.

Plan construction of the track. (See Track Specifications) Some sites have marked off lanes on tennis and basketball courts with masking tape, using cement bricks on top of the plywood used to anchor the guide wire. Other sites using parking lots or sidewalks, marked the lanes with roofing felt (the felt is the correct length and width) if the area was not smooth. As wind can easily get under the roofing paper and lift the track, be sure it is secured on all sides by duct tape. The expense for an 8 lane track of roofing felt, duct tape, plywood and cement blocks runs approximately $75.00.

Design the race day program, including time schedules and maps. Mail to schools. If appropriate, include names of local motels/hotels for overnight stays.

Make arrangements for a public address system to announce the race heats and keep the competition moving.

April/May/June

Are your mentors still in touch with their schools? Are you?

Prepare a race day checklist. (See Race Day Checklist)

Media blitz 3 weeks prior to race day.

Test track.

Prepare evaluation forms to be sent to the schools immediately after the Sprint competition for both schools that participated and schools that signed up but did not participate. (See Evaluation Form)

Volunteers

One month prior to race date: recruit race day volunteers, race judges, monitors, officials, registration, set-up, and, last but not least, clean-up.

Three weeks prior to the race date:
Have your schools register their winning teams for the competition by supplying you the names of the team members, coach, and name of car (if there is one). (See NREL Registration Forms)

Two weeks - ten days prior to the competition:
Train your volunteers. Let each one know just how wonderful they are to volunteer for this event, and **be specific on their time commitment and assignment.**

Go through your check list to verify what has been done vs. what still needs to be done.

Print the race day programs; duplicate inspection, design and race forms.

Verify lunch orders (if appropriate).

Two days prior to race date:
Make up registration packets. Include: name tags for participants and coaches; race day programs; lunch tickets (if appropriate); heat cards (should you decide to use them).

Race day
Verify your check list one more time.
Set up, host the event, clean up.
Most importantly, have fun! If you do, everyone else will!

Immediately after race day
Send thank you letters to volunteers; thank you letters to the sponsors with a picture or two of the event.

Send evaluation forms to schools. Compile information. Information gathered from the schools will be used on the Host Site Evaluation form.

Complete Host Site evaluation form and return to NREL.

Expect an evaluation report from NREL 6 to 8 weeks after all Sprint competitions have been completed.

APPENDIX A - Sample Introduction Letter and Order Form

February 23, 1993

Dear Educator:

The U.S. Department of Energy (DOE), Midwest Research Institute (MRI) and Science Pioneers invite and encourage your school participation in a Junior Solar Sprint Regional competition in Kansas City on June 19, 1993. This event is part of a National Junior Solar Sprint competition sponsored by DOE, the National Renewable Energy Laboratory, and the Society of Automotive Engineers. In 1992, 16 regional contests were held throughout the nation.

This competition is an opportunity for local seventh and eighth-grade science students to use scientific know-how, creative thinking, experimentation, and teamwork to design and build small, solar-powered model cars. All participants will use a standardized solar cell and motor. With the exception of a few car specification regulations, unlimited ingenuity and inventiveness can be used in car construction. Awards will be given for design in addition to the track event itself.

The attached material provides information on the location, race details, etc., as well as a Junior Solar Sprint Order Form. Contest rules and construction tips are included with the kit.

In addition to this competition, Sunrayce '93, a biennial intercollegiate solar-car race competition, will be making a mid-day stop in Kansas City on June 23, 1993, at the MRI facility. This 1000-mile race, sponsored by DOE, MRI, the National Renewable Energy Laboratory, and General Motors, will start in Dallas, Texas, on June 20 and finish in Minneapolis, Minnesota, on June 26. Spectators are encouraged to attend this event, and we especially encourage those involved or interested in Junior Solar Sprint to view these "full-size" cars up close.

Both Junior Solar Sprint and Sunrayce '93 are examples of hands-on, multi disciplinary projects that motivate students and illustrates how pursuing careers in the fields of science, math, and engineering can be exciting and highly rewarding particularly when applied to renewable energy sources.

We are proud to host Junior Solar Sprint and hope your school will join us in this unique and fun event. If you have questions, please contact Anne Scheer, Race Coordinator, DOE, at 426-5533.

APPENDIX A - Continued

JUNIOR SOLAR SPRINT REGIONAL

Who, What, AND Where

Seventh and eighth-grade science classes in the Kansas City area are invited to design, build and race solar-powered model cars. These small model cars -- powered entirely by solar energy and guided by wires -- should be built as team efforts under teacher guidance.

Date: June 19, 1993 (rain date June 26, 1993)

Location: University of Missouri-Kansas City
5100 Rockhill Road
Kansas City, Missouri

Race Site at UMKC - Corner of Oak and Cherry

CAR DESIGN AND CONSTRUCTION

A standardized solar car kit (consisting of a solar cell, motor, contest rules, and entry form) will be used by all participating teams. (See attached Kit Order Form). Although several kits may be ordered, only one entry from a school will be allowed. Schools will determine their entry through their own selection process. Participation will be limited to the first 50 entries received. Entry forms will be included with each kit.

RACE DETAILS AND DETERMINATION OF WINNERS

The race length is 20 meters with 1-meter-wide lanes. In order to keep the cars in their assigned lane, a guide wire will be used. An eyelet will be incorporated into the design of each of the participating cars for that wire. Complete rules and design regulations are included with each solar car kit.

The race will be run in heats until the top performing cars are determined. Each car will run in approximately 3-5 heats, depending upon the number of cars, weather conditions, etc. Prizes will be awarded to top performance cars.

The Junior Solar Sprint is both a design and track event. Design awards will be based on technology, craftsmanship, and appearance of the car.

APPENDIX A - Continued

JUNIOR SOLAR SPRINT
Kit Order Information

A Junior Solar Sprint Kit includes materials for one solar-powered vehicle. These materials consist of a solar panel, motor, contest rules, and entry form. Schools may order up to six kits for the subsidized price of $10.00 each. Schools may order additional motors for $1.00 each. Additional kits are available for $25.00 each.

Junior Solar Sprint Kits will be available for distribution to schools in mid-March. to reserve your kit(s) please complete the bottom portion of this form and return to the U.S. Department of Energy. Orders should be placed as soon as possible, and no later than April 9, 1993. If you have any questions please contact Anne Scheer, DOE, Kansas City, MO at 426-5533.

Junior Solar Sprint Kit Order Form

Teacher: _____
School: _____
School Address: _____
City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____

_____ Kits (Maximum 6) x $10.00 each = _____
_____ Additional Motors x $1.00 each = _____
_____ Additional kits x $25.00 each = _____

Total = _____

Make check payable to: National Renewable Energy Laboratory

Mail check and form to: U.S. Department of Energy
Attn: Anne Scheer
911 Walnut Street, Suite 1411
Kansas City, MO 64106

Junior Solar Sprint

Sample Sponsor Letter

September 14, 1994

The U.S. Department of Energy (DOE) and the National Renewable Energy Laboratory (NREL) are pleased to announce the fifth annual Junior Solar Sprint competitions! This national program was developed in 1990 to generate enthusiasm for renewable energy at the middle school level; to improve seventh and eighth grade students' knowledge of these concepts and energy issues; and to encourage young people to consider technical careers. For more than 40 years, DOE and its predecessor agencies have sponsored programs to improve students' knowledge of science, mathematics, energy, and technology. The Junior Solar Sprint is just one of more than 800 DOE programs aimed at preparing students to participate effectively in our growing technology-driven economy. We hope you will consider being a part of this exciting event.

Throughout the Sprint, organizations such as DOE facilities and its contractor laboratories, the Society of Automotive Engineers (SAE), public utilities, and even middle schools themselves host competitions, encouraging students in their communities to rise to the challenge set forth by the Sprint. Last year, more than 60,000 students participated in 47 regional competitions in 25 states. In 1995, we expect to host Junior Solar Sprint competitions in 35 states with more than 75,000 students participating!

We would like to request that Your Sponsor Name partner with DOE and NREL through the donation of t-shirts (hats or lunch or cost of kits or printing or money or other). Approximately _____ students, teachers and competition volunteers will take part in this event, and each will be given a commemorative _____.

The Junior Solar Sprint's corporate sponsors are vital to the success of the competitions and, therefore, are given prominent recognition for their generosity and support. Please take the time to review the enclosed video/materials. We would very much appreciate any support you can provide for the Junior Solar Sprint. I can be reached at your telephone number.

Sincerely,

APPENDIX C - Sample Press Release

For information contact:
Host Site coordinator or
Company Public Relations Office

Where and Date --- Students from 72 Colorado middle schools will bring their ideas for future solar cars to Golden May 15 to compete in the Junior Solar Sprint, a regional model solar car race designed to promote renewable energy education.

"Our goal is to help teachers teach today's youth the scientific and social principles they will need to make decisions about tomorrow's transportation systems," said Linda Lung, race coordinator and education manager for the National Renewable Energy Laboratory (NREL). "Students learn about vehicle design, fuel options, environmental impacts and energy use in an atmosphere of fun and excitement."

Each Junior Solar Sprint team is required to design and build a model car no larger than 30 cm x 60 cm x 30 cm. The cars must be powered by sunlight using a solar photovoltaic cell that converts the sun's energy into electricity. Although the cell and a motor are provided by NREL, students must consider such critical factors as aerodynamic drag, rolling resistance, weight, and drive train when designing their cars for speed and reliability.

The race is a double elimination competition with awards going to the fastest five cars. Awards also will be given for the best five car designs.

The Junior Solar Sprint starts at 10:00 am, Saturday May 15, in the courtyard at the NREL offices, 1617 Cole Boulevard, in the Denver West Office Park in Golden. The awards ceremony will take place at 3 pm.

The competition is sponsored by the U.S. Department of Energy, the Midwest Research Institute of Kansas City, MO and NREL and is endorsed by the National Science Teachers Association. Support also is being provided by the Stevinson Automotive Group, Holiday Inn West, Unique Mobility, Bolle America, Photocomm, Inc., and Warren Occupation Tech Center.

Junior Solar Sprint is a mini-version of the national SUNRAYCE, a cross-country full-size solar car race for college students that takes place June 20-27.

A list of schools participating in the Junior Solar Sprint follows.

(List schools and city they are from. This news release can be sent to the media in your area as well as the media in the area's of the schools that are participating.)

APPENDIX D - Sample Draft Agenda for Race Day

EVENT DAY PROGRAM
JUNIOR SOLAR SPRINT COMPETITION

Time	Event	Location
9:00 am	Registration	Solar Energy Research Facility - Solarium Area
9:00 am	Inspection	Solarium Area
9:00 am	Design Categories Judging	Solarium Area
10:45 am	Opening Ceremony	Parking Lot - Stage
	Welcome & Announcements • Dr. Carol Riordan, Associate Director National Renewable Energy Laboratory	
	Opening Statement • Julie Baxes	
11:00 am	Race Competition	Parking Lot
12:00-1:00 pm	Lunch	Solarium Area
1:00	Race Competition	Parking Lot
To Be Announced	Final Competition	Parking Lot
To Be Announced	Awards Ceremony Steve Hauser - Center Director Marketing Partnerships	Parking Lot - Stage
	Race Competition Design Competition	

APPENDIX E - Sample Letter to Schools that Accompanies Kits

February 16, 1994

Dear Students and Teachers:

Congratulations on being selected to participate in the Junior Solar Sprint competition. We know you are eager to begin designing and building your model solar cars. Enclosed you'll find a kit that contains a solar panel, a small motor and an information packet that provides design specifications, race rules, and solar cell activities.

You'll probably have many questions as you design and build your solar car. There are many things to think about -- what materials to use for the frame of the car, how big to make it, what kind of wheels to use and whether or not to use gears. If you run up against questions you just can't answer, you may call Gloria Kratz of the National Renewable Energy Laboratory (NREL) for help. Gloria will forward your call to one of six researchers who will provide technical assistance to you. Please call Gloria at (303) 231-7169. If you are connected to Internet, messages can be left at this mail box: solsprnt@nrel.gov. Please leave your name, phone number, what school you are with, your message and when you are available to receive messages.

Please be sure to notify me of your school's winning entry by May 1. The Junior Solar Sprint Regional race day is Saturday, May 14 at NREL in Golden, Colorado. To order food, we need to know how many people are planning to be at NREL on race day. NOTE: both students and the coach of each school will have food provided.

Your school's entry will race on smooth asphalt against cars from all over Colorado. Good luck!! See you in Golden.

Sincerely,

Linda Lung
Education Programs
(303) 231-7044
FAX: (303) 231-1006

NOTE: The following pages refer to NREL's Junior Solar Sprint Competition

COUNTDOWN TO THE JUNIOR SOLAR SPRINT FOR STUDENTS AND TEACHERS

FEB./MAR Receive race information/student packets/solar car kits
Design solar-powered cars

MARCH Start solar-powered cars
Plan intramural race

APRIL Conduct intramural race to determine school's entry to the regional race (last part of April)
Notify NREL of winning entry by May 1, 1994

MAY 14 Winner of intramural race competes in Junior Solar Sprint regional race
Race Information
Track Orientation: The track will be positioned from West (starting line) to East (finish line).
Race Time (sunlight consideration): The cars will be racing between 11:00 a.m. to 3:00 p.m.
Track Composition:
Overnight Accommodations (if needed for Friday night):

- Day's Inn: 15059 W. Colfax, Golden 277-0200
- Holiday Inn: 14707 W. Colfax, Golden 279-7611
- Chalet Motel: 6051 W. Alameda Ave., Lakewood 237-7775
- East Tin Cup Village Camper Park: 17921 W. Colfax Ave., Golden 279-6279
- Mariott Hotel: I-70 at Exit 263, Golden 279-9100
- Pleasant Valley Motel: 975 Indiana, Golden
- Mountain View Motel: 14825 W. Colfax Ave., Golden 279-2526
- Ace's Motel: 17250 W. Colfax Ave., Golden 277-1122
- Table Mountain Inn: 1310 Washington, Golden 277-9898
- La Quinta: 3301 Youngfield Service Road, Golden 279-5565
- Motel 6: I-70 & Kipling, Wheat Ridge 467-3172
- Golden Motel: 24 & Ford, Golden 279-5581
- The Homestead Motel: 8837 W. Colfax, Lakewood 232-8837
- Stonewall Motel: 12111 W. Colfax Ave., Lakewood 239-6418

MAY 15 Rain day

PARTICIPATING SCHOOLS

Below are the names and the team numbers of the competing schools:

Team 1: Virtus Banowetz
Agate School
41032 Second Ave.
P.O. Box 118
Agate, CO 80101

Team 2: John Fabian Jr.
Beulah Middle School
8734 School House Lane
Beulah, CO 81023

Team 3: Karen Scott
Byers Jr. High School
440 Main St., P.O. Box 420
Byers, CO 80103

Team 4: Anne Wright
Dolores Middle School
P.O. Box 757
Dolores, CO 81323

Team 5: Jill Parker
Elizabeth Middle School
P.O. Box 369
Elizabeth, CO 80107

Team 6: Peg Engram
Irving Jr. High School
1702 N. Murray Blvd.
Colorado Springs, CO 80915

Team 7: Don O'Brian
Maplewood Middle School
1201 21st Ave.
Greeley, CO 80631

Team 8: Connie Henderson
Prairie School
P.O. Box 68
New Raymer, CO 80142

Team 9: Ron Barela
Aguilar Jr/Sr High School
P.O. Box 567
Aguilar, CO 81020

Team 10: Alison Tyler
Bell Middle School
1001 Ulysses St.
Golden, CO 80401

Team 11: Mr. Tanaka
Cedaredge Middle School
360 North Grand Mesa Dr.
Cedaredge, CO 81413

Team 12: Del Birk
Eagle Valley Middle School
P.O. Box 1019
Eagle, CO 81631

Team 13: Terry Henderson
Ellicott Jr/Sr High School
375 S. Ellicott Hwy.
Calhan, CO 80808

Team 14: Neil Nelson
Janitell Jr. High School
7635 Fountain Mesa Rd.
Fountain, CO 80817

Team 15: Dale A. Kraemer
Miller Middle School
Junction Creek Road
Durango, CO 81301

Team 16: Scott Sanders
Revere Jr/Sr High School
300 Morgan
Ovid, CO 80744

Team 17: Ken Widel
University Lab School
University Northern Colorado
Greeley, CO 80639

Team 18: Mark A. Steward
Akron Junior High
251 E. 5th
Akron, CO 80720

Team 19: Ron Howard
Bennett Middle School
510 7th St.
Bennett, CO 80102

Team 20: Jay Donaghy
Centennial Middle School
2205 Norwood
Boulder, CO 80304

Team 21: Kevin LaBella
Eagleview Middle School
1325 Vindicator Drive
Colorado Springs, CO 80

Team 22: Ray Burden
Joanna Clapham
Evergreen Jr. High Schoo
2052 Colorado Hwy 74
Evergreen, CO 80439

Team 23: Tim Hogan
Kit Carson R-1 Schools
102 5th Ave. P.O. Box 18
Kit Carson, CO 80825

Team 24: Todd Huck
Minturn Middle School
1951 So. Hwy 24, P.O. Bo
Minturn, CO 81645

Team 25: Kent Kast
Seventh-day Adventist Ch
Academy
5410 Palmer Park Blvd.
Colorado Springs, CO 80

Team 26: Mike O'Hotto
West Grand Middle Schoo
P.O. Box 515
Kremmling, CO 80459

Team 27: Kenn Estes
Aragon Middle School
211 S. Main
Fountain, CO 80817

Team 28: Bryce Monasm
Bethune Jr/Sr High Schoo
145 W. 3rd St., P.O. Box 1

Bethune, CO 80805

Team 29: Twila Geroux
Custer County School
P.O. Box 730
Westcliffe, CO 81252-0730

Team 30: John G. Young
East Grand Middle School
1197 West Diamond
P.O. Box 2210
Granby, CO 80446

Team 31: Rich Sumpter
Haxtun Jr. High School
P.O. Box 548
Haxtun, CO 80731

Team 32: Sam Grimsley
Joy Klein
La Junta Middle School
9th & Smithland
La Junta, CO 81050

Team 33: Lee Wadleigh
Nevin Platt Middle School
6096 Baseline Road
Boulder, CO 80303

Team 34: Carolyn Rudy
Sinclair Middle School
300 W. Chenango
Englewood, CO 80110

Team 35: Mike Waldvogle
West Jefferson Jr. High
9449 So. Barnes Ave.
Conifer, CO 80433

Team 36: Fran Golding
Big Sandy School
609 Pueblo St., P.O. Box 68
Simla, CO 80808

Team 37: Lisa McGrath
Deer Creek Middle School
9201 W. Columbine
Littleton, CO 80123

Team 38: Dan Rosen
East Middle School
830 Gunnison Ave.
Grand Junction, CO 81501

Team 39: Greg Richards
Hayden Middle School
P.O. Box 70
Hayden, CO 81639

Team 40: Barb Sharshel
Las Animans Middle School
1214 Thompson Blvd.
Las Animas, CO 81054

Team 41: Steve Slater
Northglenn Jr. High School
1123 Muriel Dr.
Northglenn, CO 80233

Team 42: Marsha Corey
Southern Hills Middle School
1500 Knox Dr.
Boulder, CO 80303

Team 43: Larry Kilgore
Westview Middle School
1651 Airport Road
Longmont, CO 80503

Team 44: Thomas Smith
Boltz Jr. High School
720 Boltz Drive
Fort Collins, CO 80525

Team 45: Pam Cobb
Divine Redeemer
901 N. Logan
Colorado Springs, CO 80909

Team 46: David Erwin
Elbert Jr/Sr High School
P.O. Box 38
Elbert, CO 80106

Team 47: Louise Belnay
Rebecca Marques
Hodgkins Middle School
3475 W. 67th So.
Denver, CO 80021

Team 48: Lars Peterson
Louisville Middle School
1341 Main St.
Louisville, CO 80027

Team 49: Eric Fagrelius
Ouray Middle School
P.O. Box N
Ouray, CO 81427

Team 50: Rob Berlinski
Aurora Hills Middle Schoo
1009 S. Uvalda
Aurora, CO 80012

Team 51: Cynthia Wilbur
Wheat Ridge Middle Scho
7101 W. 38th Avenue
Wheat Ridge, CO 80033

Team 52: Richard O'Conr
Central Lakewood ADT
1005 N Wadsworth
Lakewood, CO 80215

Team 53: Dick Miller
Faith Christian Academy
6210 Ward Road
Arvada, CO 80004

Team 54: Michael Thornt
Community Christian Scho
2306 E Empire
Cortez, CO 81321

Team 55: Ken Cressy/Lin
North Middle School
12095 Montview Blvd
Aurora, CO 80010-1608

Team 56: Joe Mikkelson

Cresthill Middle School
9195 Cresthill Lane
Highlands Ranch, CO 80126

RACE DAY SCHEDULE

National Renewable Energy Laboratory

Registration: 10:00 a.m. Solar Energy Research Facility (SERF)

Inspection Requirements: Prior to your car entering in the race heats, it will need to be inspected to make sure that it meets race specifications (See Inspection Checklist).

Design Competition: The car should also be judged in the design competition prior to the race. If you do not get the car judged for the design portion of the competition you will run the risk of having your car damaged during the race.

Racing Heats:
Race 1:

Time	Heat#	Teams
11:00	1	Teams 1-10
11:10	2	Teams 11-20
11:20	3	Teams 21-29
11:30	4	Teams 30-38
11:40	5	Teams 39-47
11:50	6	Teams 48-56

All of the remaining elimination rounds will be posted on the scoreboard after these initial heats.

NOTE: **You must report promptly to the race course at your designated time slot. If you are not present for the designated heat this will count as a loss. If you miss both heats, your car will be eliminated from the race competition. You will still be able to compete in the design competition.**

RACE RULES

The following information will describe the rules/regulations of the Regional event at the National Renewable Energy Laboratory.

Background

The Junior Solar Sprint is a science class based design and track competition for solar-powered model cars. It is sponsored and organized by the U.S. Department of Energy (DOE), National Renewable Energy Laboratory (NREL), and the Society of Automotive Engineers (SAE) and endorsed by the National Science Teachers Association (NSTA). The competition is open to science classes in seventh and eighth grades as of the 1994 spring semester.

Administration and Organization

Each school determines its entry to the regional race. (Information will be provided on conducting an intra-mural race.)

Car Parameters

Each entry will be provided with a silicon solar cell and a motor. The motor may not be modified (i.e., rewound, lightened, etc.) but must be used as supplied. The solar panel may not be modified but must be used as supplied. At least one car wheel must be driven.

No batteries or other storage devices (e.g. flywheels) of any kind are permitted. The solar cell and the sun's light must be the only energy source used to power the car. Any energy enhancing devices (e.g. reflectors) must be attached to the car.

The car dimensions may not exceed 30 cm. in width, 60 cm. in length, and 30 cm. in height. Each car must have a three-dimensional body shell. The decals of sponsoring organizations must be displayed on each side leaving a 4 square centimeter blank space on each side for a number. Decals and numbers will be provided.

An eyelet of the design (See Eyelet Design) must be attached to the bottom of each car at the front end. During competition, a guide wire will go through the eyelet to keep the car in its lane. The guide wire will be 1 cm. (+/- .5 cm.) off the ground. The car must remain on the guide wire. This is the only allowable method of steering the car. No radio control is allowed. Lane changing/crossing will result in disqualification from the heat.

You must use this years solar panel and motor. The inspection judges will be checking for this during the inspection phase of the competition.

CONDUCT OF THE RACE

The race length is 20 meters with 1 meter wide lanes. The track is a hard, flat, smooth surface such as a tennis court.

To start, one team member will hold a cardboard sheet over the solar panel and then uncover the panel when the start signal is given. False starts may result in disqualification from the heat. One team member must wait at the finish line to catch the car to prevent damage to it.

Team members may not accompany the car in its lane during the race. However, one team member may free the car from wire binding or track imperfections. (S)he may also make repairs if a mechanical or an electrical failure, such as a loose power wire, occurs. Team members may not push the car or give any other physical assistance. They may not change the car's mechanical/electrical characteristics (e.g. shift a transmission) after the start of the heat. Physical assistance, unauthorized repair, unauthorized people in the lane or unsportsmanlike conduct will result in disqualification from the heat, as determined by Race Officials.

One team member must be present at the Finish Line to stop the car. The car must remain in its lane at the Finish Line until the order of the cars has been established. Teams that leave the Finish Line prematurely or miss subsequent heats may be disqualified.

DETERMINATION OF WINNERS/PENALTIES

The Junior Solar Sprint is both a design and a performance event. Five design awards will be given to cars based on the following criteria: chassis; transmission; solar array; appearance; craftsmanship; and innovation.

The Junior Solar Sprint will be run in heats. The number of heats will be determined locally depending on the total number of cars, weather conditions, etc. A car will race until it accumulates two losses. Heats will continue until the top five performing cars are determined.

RACE FORMAT

There are a variety of race formats available. Any one may be used that includes:

1. At least a double elimination (two losses) before a car no longer races.

2. Lane changes so that a vehicle does not consistently race in the same lane.

3. Mixing of the cars so that they do not race against the same cars every race.

A sample of a Double Elimination Format is included.

This format uses a win/lose method. A finish-line official identifies the first one or two cars across the finish-line. If resources permit, a simple timing device will be used to identify the placement of the cars at the finish-line.

Race 1		Race 2 One Loss	Race 3 No Loss	Race 4 One Loss	Sponsor's Race	Race 5 Final Heat 20
11:00 am - Heat 1 Lane A - #1 - Agate School Lane B - #2 - Beulah Middle School Lane C - #3 - Byers Jr. High School Lane D - #4 - Dolores Middle School Lane E - #5 - Elizabeth Middle School Lane F - #6 - Irving Jr. High School Lane G - #7 - Maplewood Middle School Lane H - #8 - Prairie School Lane I - #9 - Aguilar Jr/Sr High School Lane J -	11:50 am - Heat 6 Lane A - #46 - Elbert Jr/Sr High Lane B - #47 - Hodgkins Middle Lane C - #48 - Louisville Middle Lane D - #49 - Ouray Middle Lane E - #50 - Aurora Hill Middle Lane F - #51 - Wheat Ridge Middle Lane G - #52 - Central Lakewood Lane H - #53 - Faith Christian Lane I - #54 - Community Christian Lane J - #55 - North Middle School	12:20 pm - Heat 9 Lane A Lane B Lane C Lane D Lane E Lane F Lane G Lane H Lane I Lane J			2:10 Lane A Lane B Lane C Lane D Lane E Lane F Lane G Lane H Lane I Lane J	2:20 Lane A Lane B Lane C Lane D Lane E Lane F Lane G Lane H Lane I Lane J
11:10 am - Heat 2 Lane A - #10 - Bell Middle School Lane B - #11 - Cedaredge Middle School Lane C - #12 - Eagle Valley Middle Lane D - #13 - Ellicott Jr/Sr High Lane E - #14 - Janitell Jr High Lane F - #15 - Miller Middle School Lane G - #16 - Revere Jr/Sr High Lane H - #17 - University Lab School Lane I - #18 - Akron Junior High Lane J -		12:30 pm - Heat 10 Lane A Lane B Lane C Lane D Lane E Lane F Lane G Lane H Lane I Lane J	1:20 pm - Heat 15 Lane A Lane B Lane C Lane D Lane E Lane F Lane G Lane H Lane I Lane J	1:40 pm - Heat 17 Lane A Lane B Lane C Lane D Lane E Lane F Lane G Lane H Lane I Lane J		
11:20 am - Heat 3 Lane A - #19 - Bennett Middle School Lane B - #20 - Centennial Middle School Lane C - #21 - Eagleview Middle School Lane D - #22 - Evergreen Jr High School Lane E - #23 - Kit Carson Lane F - #24 - Minturn Middle School Lane G - #25 - Seventh-day Adventist Lane H - #26 - West Grand Middle Lane I - #27 - Aragon Middle School Lane J -		12:40 pm - Heat 11 Lane A Lane B Lane C Lane D Lane E Lane F Lane G Lane H Lane I Lane J	1:30 pm - Heat 16 Lane A Lane B Lane C Lane D Lane E Lane F Lane G Lane H Lane I Lane J	1:50 pm - Heat 18 Lane A Lane B Lane C Lane D Lane E Lane F Lane G Lane H Lane I Lane J		
11:30 am - Heat 4 Lane A - #28 - Bethune Jr/Sr High Lane B - #29 - Custer County School Lane C - #30 - East Grand Middle Lane D - #31 - Haxtun Jr High School Lane E - #32 - La Junta Middle School Lane F - #33 - Nevin Platt Middle School Lane G - #34 - Sinclair Middle School Lane H - #35 - West Jefferson Jr High Lane I - #36 - Big Sandy School Lane J -		12:50 pm - Heat 12 Lane A Lane B Lane C Lane D Lane E Lane F Lane G Lane H Lane I Lane J		2:00 pm - Heat 19 Lane A Lane B Lane C Lane D Lane E Lane F Lane G Lane H Lane I Lane J		
11:40 am - Heat 5 Lane A - #37 - Deer Creek Middle Lane B - #38 - East Middle School Lane C - #39 - Hayden Middle School Lane D - #40 - Las Animas Middle Lane E - #41 - Northglenn Jr High Lane F - #42 - Southern Hills Middle Lane G - #43 - Westview Middle Lane H - #44 - Boltz Junior High Lane I - #45 - Divine Redeemer Lane J - #56 - Cresthill Middle		1:00 pm - Heat 13 Lane A Lane B Lane C Lane D Lane E Lane F Lane G Lane H Lane I Lane J				

DOUBLE ELIMINATION

The Double Elimination Diagram is set up for the Colorado competition with 55 cars racing in 10 lanes. This diagram will illustrate how the competition will progress through the different heats.

RACE 1: Race cars in heats of nine to ten cars at a time. The two fastest cars from each heat move to Race 3. The remaining slower cars move to Race 2.

RACE 2: These cars all have one loss each. Race cars in heats of nine or ten cars at a time. The two fastest cars from each heat moves to Race 4. The slower cars now have two losses and are done competing.

RACE 3: These cars have no losses. Race cars in heats of eight cars at a time. The two fastest cars from each heat moves to Race 5. The slower cars move to Race 4.

RACE 4: These cars have one loss each. Race cars in heats of eight to ten. The two fastest cars from each heat move to participate in Race 5. The slower cars now have two losses each and are done competing.

RACE 5: The remaining 10 cars compete for first, second, third, fourth, and fifth place.

Junior Solar Sprint

Car Number_____School_____.

Inspection Checklist

____Car length not greater than 60 cm.

____Car width not greater than 30 cm.

____Car height not greater than 30 cm.

____Original solar panel (not modified)

____Three dimensional body shell

____Number mounted on each side of car

____ Sponsor decals mounted on side of car

____ Eyelet on bottom of car near front end

____ Original motor (not modified)

____ At least one wheel driven by motor

____ No radio control device

____ No batteries or storage device

Car weight = _____

☐ Passes Inspection ☐ Fails Inspection _____

Signature of Inspector

Best Design Scoring

Poor	0-1
Fair	2-3
Good	4-5-6
Impressive	7-8
Awesome!	9-10

Category	Points Earned
Chassis	
Transmission	
Solar Array	
Appearance	
Craftsmanship	
Innovation	

Total Points

_____

Signature(s) of Design Judge(s)

BEST DESIGN CATEGORIES

Awards will be given for the BEST DESIGN. Points are earned in 6 categories. There is a maximum of 10 points per category on the following scale:

0 - 1	2 - 3	4 - 5 - 6	7 - 8	9 - 10
POOR	FAIR	GOOD	IMPRESSIVE	AWESOME!

Please be CONSISTENT in awarding points in the following categories:

CHASSIS: How well constructed are the frame, bearings, tires, etc.

TRANSMISSION: How well mounted is the motor and how efficiently is power transmitted to the wheels?

SOLAR ARRAY: How well oriented is the solar panel for light reception?

APPEARANCE: How well designed and how well finished is the car?

CRAFTSMANSHIP: How well constructed is the car overall?

INNOVATION: How much creativity overall?

TRACK SPECIFICATIONS

Track Length: 20 meters

Lane Width: 1 meter

Number of Lanes: The number of lanes depends on the total entrants and time available. Each heat takes about 5 minutes. Each car should run at least twice in a double elimination heat format.

Surface: The surface should be as smooth as possible, flat and level or slightly downhill in the direction of the race. The racing surface must be fully exposed to the sun all day. It should be oriented so that prevailing winds are behind the cars. Crosswinds are a real problem. Sweep the track before the race to clear it of any debris.

Layout: The guide wires are hard to see. Security roping should be set up around the perimeter to protect the track. A second security roping should be used for team movement and to keep spectators off the track. In addition to the racing surface, there must be a staging area near the starting line and a run-off area beyond the finish line. A "pit" area is needed for "tune-ups" between races. The pit area should have two practice guide lines. (See Lane Set Up)

Guide Lines: 40- to 60-pound test monofilament fishing line is adequate. The line should be suspended about 1 cm. (+/- .5 cm) off the ground. (See Guide Wire) for suggesting mounting. The lines must be kept guitar-string taut.

Timer: Some method is needed to determine the placement of cars at the finish line. Finish line judges may use a timing device. The timer need not measure speed but must be able to determine each car's place.

Communication: Efficient communication is needed between the starting line, the finish line and the scoreboard. A loudspeaker or bullhorn is helpful for public announcements and crowd control.

Lane Set Up

Guide Wire
Track Specifications

One lane with a timing device viewed from above:

Detail of anchor (parts #1 in above diagram) for guide wire:

A 12" x 12" piece of 3/4" plywood was used to anchor both ends of the guide wire. A corner-reinforcing bracket was slotted to accept a threaded eyebolt to allow for height adjustment of the guide wire. The plywood was chiseled out on the bottom to accept the bracket.

The guide wires were pre-measured and attached to the eyebolts with clips. The clips were purchased at a fishing tackle store as was the 40# monofilament line used for the guide wire.

Once assembled, the plywood was anchored with 40 pounds of ballast and moved apart to give the desired line tension.

Eyelet Design

Intramural Race

The purpose of the intramural race is to determine your school's entry to the regional race.

There are several options for determining your school's entry:

1. Teacher decision. It is not mandatory to conduct an intramural race.

2. By the clock. A school can set up one lane per the enclosed instructions and race each car against the clock. The car with the best average time becomes the entry to the regional race.

3. Lane races. Construct (at least three) lanes and conduct a modified Double Elimination Race. Instructions for lane construction and race formats are enclosed.

4. Full-scale intramural race. The Junior Solar Sprint is a great opportunity for publicity at many levels (school, local, TV) and a good builder of school spirit. The intramural race can be held at any time prior to the regional race. Use the instructions for lane construction and suggested race format.

Intramural Registration

Complete this registration for each car competing in the Intramural Competition:

NUMBER ASSIGNED TO CAR FOR INTRAMURAL _____
NAME OF CAR _____
STUDENT TEAM

_____ Phone (___) _____
_____ Phone (___) _____
_____ Phone (___) _____
_____ Phone (___) _____
_____ Phone (___) _____
_____ Phone (___) _____

SCHOOL _____

SCHOOL ADDRESS _____
CITY _____ STATE ____ ZIP _____
PHONE (____) _____

TEACHER _____
TEACHER HOME ADDRESS _____
CITY _____ STATE ____ ZIP _____
HOME PHONE (____) _____

NREL REGISTRATION FORMS

For the winning team that will be competing at the National Renewable Energy Laboratory (NREL), please complete and mail the following forms by May 1.

A team is comprised of 2-4 students and a coach. NREL will provide lunches for the "TEAM".

Mail the forms to:

National Renewable Energy Laboratory
Linda Lung
1617 Cole Blvd.
Golden, CO 80401
(303) 275-3044
1-800-NEW-ENGY
FAX: (303) 275-3076
E-mail: linda_lung@nrel.gov

SPRINT
REGISTRATION FORM

(Please Type or Print Clearly)

SCHOOL_____Telephone_____Principal_____
SCHOOL ADDRESS_____
SOLAR CAR NAME:_____

TEAM MEMBERS:

1. Name_____(Nickname)_____SSN_____DOB_____
   Address_____State_____Zip_____
   Home Phone_____Grade_____Sex: M F Citizenship: U.S____Other (Country)_____
2. Name_____(Nickname)_____SSN_____DOB_____
   Address_____State_____Zip_____
   Home Phone_____Grade_____Sex: M F Citizenship: U.S____Other (Country)_____
3. Name_____(Nickname)_____SSN_____DOB_____
   Address_____State_____Zip_____
   Home Phone_____Grade_____Sex: M F Citizenship: U.S____Other (Country)_____
4. Name_____(Nickname)_____SSN_____DOB_____
   Address_____State_____Zip_____
   Home Phone_____Grade_____Sex: M F Citizenship: U.S____Other (Country)_____

COACH:

Name_____(Nickname)_____SSN_____DOB_____
Address_____State_____Zip_____
Home Phone_____Grade_____Sex: M F Citizenship: U.S____Other (Country)_____

Coaches Signature_____

Local Newspaper_____Newspaper Phone_____

ONLY THOSE STUDENTS LISTED ABOVE ARE ELIGIBLE TO COMPETE ON YOUR SCHOOL'S TEAM

JUNIOR SOLAR SPRINT COMPETITION

BIOGRAPHICAL PROFILES

(one for each student)

(Please Type/Print)

Name _____Grade_____

Middle School _____

Favorite Subject(s): _____

_____

Offices held (e.g. Student Council, Student Body Officer, Honor Roll):_____

_____

_____

Volunteer Work: _____

Future Education Plans (list college/university and potential major): _____

_____

Career Goal:_____

_____

_____

School Mascot: _____

NATIONAL RENEWABLE ENERGY LABORATORY
1994 Junior Solar Sprint Competition
Medical Form
(one for each child)
Confidential Medical Information and Emergency Notification Form

Name_____Birth date_____Sex: M F

Street Address_____

City_____State_____Zip Code_____

Home Telephone_____SSN_____

Date of Last Tetanus Shot_____Drug Allergies_____

_____

Physician_____Physician's Phone _____

Medical Conditions or Previous Surgery_____

_____

Regular Medications_____

_____

Special Dietary Requirements (include food allergies)_____

_____

Special Physical Needs_____

_____FAMILY INFORMATION

Father's Name_____Work Phone_____

Mother's Name_____Work Phone_____

Legal Guardian
(if applicable)_____Work Phone_____

Emergency Contact_____Phone_____

Relationship to Student_____

Medical/Hospital
Insurance Carrier_____Policy #_____

_____CONSENT TO MEDICAL CARE AND TREATMENT

(Parental consent is required before a hospital's emergency department can give medical treatment to a minor. Every effort will be made to contact parents, but a completed consent form will expedite treatment)

I hereby authorize and consent to the administration of all medical and/or surgical treatment(s) to my child by a licensed physician or hospital in the event I am not available to consult with the attending physician(s), attempts to contact me have been unsuccessful, and the attending physician(s) deem it advisable to proceed with such treatment(s).

_____ _____
Signature of Parent or Legal Guardian Date

COACH BIOGRAPHICAL PROFILE

JUNIOR SOLAR SPRINT COMPETITION

(Please Type/Print)

Name _____ Grade(s) Taught_____

School_____

Subjects Taught:_____

_____

Years in Teaching Profession: _____

College/University Attended: _____

Field Specialization: _____

What influenced your decision to become a math/science teacher:_____

_____

_____

What three scientific discoveries do you consider most important:_____

_____

_____

Hobbies: _____

_____

JUNIOR SOLAR SPRINT COMPETITION

SCHOOL/COMMUNITY PROFILE

(Please Print/Type)

Name of School _____

School Population _____ Ethnic Diversity _____

School Colors _____ Mascot _____

DESCRIBE YOUR COMMUNITY (urban, rural, industrial, major businesses, universities, etc):

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

DRAFT AGENDA FOR RACE DAY

Time	Event	Location
9:00	Registration	Solarium Area, SERF
9:00	Inspection Judging	Solarium Area, SERF
9:00	Design Judging	Solarium Area, SERF
10:30	Opening Ceremony	Parking Lot, Stage, SERF
11:00	Race Competition Begins	Parking Lot, SERF
11:30 - 1:00 pm	Serve Lunch	Solarium Area, SERF
TBD	Sponsors - Competition	Parking Lot, SERF
1:30	Final Heat	Parking Lot, SERF
2:00	Awards Ceremony Awards Design 1st, 2nd, 3rd, 4th, 5th Race Competition 1st, 2nd, 3rd, 4th, 5th	Parking Lot, Stage

RACE DAY CHECKLIST

Monday: May 10, 1993
Last meeting of the Planning Committee
List of schools that are participating
Provide Master of Ceremonies with information
Dry run of score keeping computer system

Track needs work this week.
- Build
- Eyelets attached

Items to pick up:

T-shirts, Duck Company, get invoice, do request for check (pick up Weds/facilities)
Jade Mountain, exhibits/products (delivery Tuesday)
Track/Warren Tech (delivery Friday afternoon)
Scoreboard, Easels, Banner, Signs/Warren Tech (delivery Friday afternoon)
Trophies, Ribbons/ Colorado Badge and Trophy (pick up Thursday afternoon)
Western Catering, Inc., (need invoice, do request for check, final count Thursday afternoon)
Solar World cells cut and mounted on the trophies (delivery to Colorado Badge and Trophy no later than Tuesday cob)
Programs duplicated (Wednesday to copy center)

Wednesday: May 12, 1993
- Training for the Volunteers 2:00 - 5:00 17/4B
  - Show video
  - Run down of the entire day
  - Check with volunteer in charge of that area
  - if not, check with Gloria

Friday: May 14, 1993
- Set up track and practice track in courtyard
- Rope off area with spectator tape
- Set up registration area
  - 3 tables, chairs for school registration
  - 1 table, chairs for volunteers, exhibitors and press

- Registration signs
  - 3 signs for parking lots
  - 1 sign for student registration
  - 1 sign for volunteers, press, and exhibitors
  - Name tags for exhibitors and press
- Packets for participants:
  - Race program
  - Lunch tickets
  - T-shirts
  - Name tags
- Set up Inspection area
  - 3 tables, chairs
  - signs from courtyard to Bldg..
  - signs for inspection tables
  - Inspection checklist forms
  - walkie talkie
  - pencils for inspection team
  - set up of inspection guidelines
- Set up Design area
  - 3 tables, chairs
  - signs for tables
  - Design score sheets for judges
  - Walkie Talkie
  - pencils for judges
- Set up work stations
  - 5 tables and chairs near outlets for students to work on cars
- Race Start area
  - Table, chair
  - list of the schools
  - 2 easel charts to write now and next heats
  - eraser
  - marker pen
- Crowd control devices
  - Cones, roping, signs, PA system
- Check equipment
  - PA system
  - scoring system
- Gazebo area
  - Trophy table
  - Raffle prizes, giveaways
    - solar hats from Photocomm
    - NREL backpack
    - NREL travel kit (Prize for sponsor's race)
    - NREL Frisbees

Gazebo area, con't
- Bandimere t-shirt
- hang signs for information, lost and found, officials
- Scoreboard position
- Hang banner

Parking Lot
- Confirm time of delivery for Sanolets
- Sanolets delivered to parking lot (someone there to show where)
- Cones and roping
- Trash cans and recycle bins
- Inform security of activities
- SAC tent set up
- tables and chairs for lunch

Saturday:
- Bring out t-shirts
- Registration packets
- NREL information booth
  - table and chair
- Car display- rope off
- Lunch truck set up
- film for kid photographers
- Instructions to Colorado Institute of Art photographers

Sponsors race:
- DOE
- NREL
- Unique Mobility
- Bolle America
- Keystone Science School
- Photocomm, Inc
- Warren Occupation Technical Center

Evaluation Form

June 9, 1994

Dear Junior Solar Sprint participant;

Thank you for participating in the Colorado Junior Solar Sprint competition. We could tell by the of time and effort into your cars. We appreciate you being at this event!

NREL is planning a Junior Solar Sprint evaluation meeting on June 20 and 21, 1994. The meeting will take place from 1 p.m. to 5 p.m. on Monday, June 20 and from 8 a.m. to noon on Tuesday, June 21. We will meet in conference room 16/3A in Building 16 at 1617 Cole Boulevard, Golden, Colorado. This meeting will cover the national Sprint competitions, as well as feedback from the Colorado Sprint. Please RSVP to me by June 17 if you can attend all or part of this meeting.

Your feedback of the Sprint is important to us. If there is any way to improve the competition we want to know about it. If you cannot attend the evaluation meeting please take the time to complete the enclosed evaluation forms and return them to me by June 17, 1994. The results of the evaluation will be complied for a report to be presented at the evaluation meeting.

Thank you in advance for helping us improve the Sprint competition. We look forward to seeing a team from your school next year!

Sincerely;

Gloria Kratz
The Center for Science Education
(303) 275-3069
1-800-NEW-ENGY
FAX: (303) 275-3076

Colorado Junior Solar Sprint Competition
May 14, 1994

Please take a few minutes to complete this evaluation form about the Colorado Junior Solar Sprint competition. We are always trying to improve this event so your feedback is very important.

Please rate the following components of the competition. Use the scale of 5 being the highest and 1 the lowest. If you did not use the material, please indicate why.

Are you a coach ____ or a student____?

Materials

Getting Started Packet 5 4 3 2 1

Comments: _____

Teacher Guide 5 4 3 2 1

Comments: _____

Student Guide 5 4 3 2 1

Comments: _____

Computer Software/instructions 5 4 3 2 1

Comments: _____

Video 5 4 3 2 1

Comments: _____

Color Flyer: 5 4 3 2 1

Comments: _____

Would a teacher in service have assisted you in assisting the students build their cars?

_____

_____

_____

Newsletter #1 5 4 3 2 1

Comments: _____

Newsletter #2 5 4 3 2 1

Comments: _____

What other information would have been beneficial in the newsletters?

_____

_____

Administration

Timeliness of materials 5 4 3 2 1

Comments: _____

Did you use the 1-800 telephone number? ____ Yes ____ No

Did you receive prompt answers to your questions? ____ Yes ____ No

What could NREL have done to better assist you?

_____

_____

Race Day

Registration 5 4 3 2 1

Comments: _____

Practice Track 5 4 3 2 1

Comments: _____

Track 5 4 3 2 1

Comments: _____

Lunch 5 4 3 2 1

Comments: _____

Awards 5 4 3 2 1

Comments: _____

What did you like most about the Junior Solar Sprint?

_____

_____

_____

What did you like least about the Junior Solar Sprint?

_____

_____

_____

Suggestions, comments, ideas, complaints

_____

_____

_____

Please return this evaluation form to: Gloria Kratz, Special Events Administrator, NREL, 1617 Cole Blvd., Golden, CO 80401. FAX # (303) 275-3067. 1-800-NEW-ENGY

June 10, 1994

Dear Junior Solar Sprint Coach:

On May 14, 1994, NREL sponsored the Junior Solar Sprint competition. You had signed up to participate, and ordered kits, but a team from your school did not compete. We would like to find out why. Was there a conflict with the date? Was traveling to Golden, Colorado on a Saturday a consideration for not coming? Were the materials useful?

As we begin preparation for next year's competition, we would like your feedback. Please take a few moments to complete the enclosed evaluation form and return it to me. We would like to see as many teams as possible compete in this event.

Thank you for your comments, suggestions and ideas.

Sincerely,

Gloria Kratz
Center for Science Education
(303) 275-3069
1-800-NEW-ENGY
FAX: (303) 275-3076

Colorado Junior Solar Sprint Competition

Please take a few minutes to complete this evaluation form about the Colorado Junior Solar Sprint competition. We are always trying to improve this event so your feedback is very important.

Please rate the following components of the Junior Solar Sprint. Use the scale of 5 being the highest and 1 the lowest. If you did not use the material, please indicate why.

Materials

Getting Started Packet 5 4 3 2 1

Comments: _____

Teacher Guide 5 4 3 2 1

Comments: _____

Student Guide 5 4 3 2 1

Comments: _____

Computer Software/instructions 5 4 3 2 1

Comments: _____

Video 5 4 3 2 1

Comments: _____

Color Flyer: 5 4 3 2 1

Comments: _____

Newsletter #1 5 4 3 2 1

Comments: _____

Newsletter #2 5 4 3 2 1

Comments: _____

What other information would have been beneficial in the newsletters?

_____

_____

Administration

Timeliness of materials 5 4 3 2 1

Comments: _____

Did you use the 1-800 telephone number? ____ Yes ____ No

Did you receive prompt answers to your questions? ____ Yes ____ No

Reason for not participating in the Junior Solar Sprint competition:

Would a teacher in service have assisted you in assisting the students build their cars?

What could NREL have done to better assist you?

Suggestions, comments, ideas, complaints

Please return this evaluation form to: Gloria Kratz, Special Events Administrator, NREL, 1617 Cole Blvd., Golden, CO 80401. FAX # (303) 275-3076. 1-800-NEW-ENGY

Sample JSS Race Day Program

NATIONAL RENEWABLE ENERGY LABORATORY

WITH

U.S. Department of Energy

and

Midwest Research Institute

present

JUNIOR SOLAR SPRINT

TABLE OF CONTENTS

INTRODUCTION

Junior Solar Sprint is an annual competition for sixth, seventh and eighth grade students to design, build and race model solar powered cars steered by guide wires. The students are provided with kits which include a motor and solar panel. The chassis, wheels and transmission are made from any other materials. Students are encouraged to use math and science principles together with their creativity in a fun, hand-on educational program that stimulates enthusiasm for science at a crucial stage in their education.

Hands-on design has a different feel from textbook problem solving, or even traditional science labs. There is no single correct answer, any number of solutions developed by students can work. We have found that students are excited about generating ideas in a group and then building and modifying models based on these ideas. Students can see for themselves how changes in design are reflected in car performance. Teachers/coaches will have the opportunity to guide their students through a process similar to those used by professional design engineers.

The goals of the program are as follows:

- Present science concepts in a fun and exciting way.
- Give students a chance to interact with engineers and scientists.
- Stimulate creative thinking through a hands-on design project.
- Help students to experience the satisfaction of creating a working machine and the excitement of entering it in a competition.

EVENT DAY PROGRAM
JUNIOR SOLAR SPRINT COMPETITION

TIME	EVENT	LOCATION
9:00 am	Registration	Solar Energy Research Facility Solarium Area
9:00 am	Inspection Judging	Solar Energy Research Facility Solarium Area
9:00 am	Design Categories Judging	Solar Energy Research Facility Solarium Area
10:30 am	Opening Ceremony	Parking Lot-Stage
	Welcome and Announcements - Julie Baxes National Renewable Energy Laboratory	
	Opening Statement - Dr. Robert Stokes, Deputy Director National Renewable Energy Laboratory	
11:00 am	Race Competition	Parking Lot- Solar Energy Research Facility
11:30 am	Lunch	Solar Energy Research Facility Solarium Area
TBA	Sponsors-Technical Competition	Parking Lot
1:30 pm	Final Heat	Parking Lot
2:30 pm	Awards Ceremony	Parking Lot- Stage
	- Julie Baxes - Billy Thompson - Denver Broncos - Retired	
	Awards	
	Design Competition 1st, 2nd, 3rd, 4th, 5th Place	
	Race Competition 1st, 2nd, 3rd, 4th, 5th Place	

PARTICIPATING SCHOOLS

Below are the names and the teams numbers of the competing schools:

Team 1: **Agate School,** Agate, CO., Coach: Virtus Banowetz
Team 2: **Beulah Middle School,** Beulah, CO., Coach: John Fabian, Junior
Team Members: Jason White, Jason Lectenburg, Chris Moore, Kelly Reutter
Solar Car Name: Phantum
Team 3: **Byers Junior High School,** Byers, CO., Coach: Karen Scott
Team Members: Joshua Morita, Bruce Julin
Solar Car Name: Patriot
Team 5: **Elizabeth Middle School,** Elizabeth, CO., Coach: Jill Parker
Team Members: George Wallace, Jonathon Cross
Team 7: **Maplewood Middle School,** Greeley, CO., Coach: Chris Caldwell
Team Members: Stan Vanhaverbeck, Zach Koehler, Scott Anderson, Jeremy Ruybal
Solar Car Name: Bullet
Team 8: **Prairie School,** New Raymer, CO., Coach: Connie Henderson
Team Members: Justin Mertens, Rob Hernandez, Todd Farnik, Shawn Younger
Team 10: **Bell Middle School,** Golden, CO., Coach: Elaine Connally
Team Members: Edward Burke, Michael Pfisterer
Team 12: **Eagle Valley Middle School,** Eagle, CO., Coach: Linda Jones
Team Members: Troy Cunningham, Jason Martin, Todd Ewing, Jeramyn Feucht
Solar Car Name: Sera Sera
Team 14: **Janitell Junior High School,** Fountain, CO., Coach: Rob Utter
Team Members: Heather Beckley, Adam Bolen, Charles Doan, Simon Shah
Solar Car Name: The Speed Demon
Team 16: **Revere Junior/Senior High School,** Coach: Scott Sanders
Team 17: **University Lab School,** Greely, CO., Coach: Ken Widel
Team 18: **Akron Junior High,** Akron, CO., Coach: Mark Steward
Team Members; Kyle Cooper, Kevin Jesse, Kerry Hayes
Solar Car Name: George
Team 19: **Adams City Middle School,** Commerce City, CO., Coach: Mike Bentley
Team Members: Joe Fiero, Mike Brohpy
Team 20: **Centennial Middle School,** Boulder, CO., Coach: Jay Donaghy
Team 21: **Eagleview Junior High School,** Colorado Springs, CO., Coach: Kevin LaBella
Team Members: Clint Bluestein, Geoffrey Potts, Matt Gowler, Jeremy Bary
Solar Car Name: Intrepid
Team 22: **Evergreen Junior High,** Evergreen, CO., Coaches: Ray Burden, Janna Clapham
Team Members; Ryan LaPointe, John McFadden, Drew Southard
Solar Car Name: Ram Charger
Team 24: **Minturn Middle School,** Minturn, CO., Coach: Todd Huck
Team Members: Anthony Valdez, K.C. Lang, Ben Nelson, Emerald Felix
Team 27: **Aragon Middle School,** Fountain, CO., Coach: Kenn Estes
Team Members: Ryan Stover, Nathan Headley, Jonathan Watts
Team 28: **Bethune Junior/Senior High School,** Bethune, CO., Coach: Bryce Monasmith
Team Members: Jeremiah Cummons, Eric Allision, Beth Hogerguis, Erick Meyer

Team 29: **Custer County School,** Westcliffe, CO., Coach: Twila Geroux
Team Members: Jeremy Tomsick, Shane Anderson, Matt Hobby
Team 30: **East Grand Middle School,** Granby, CO., Coach: John Young
Team Members: Brett Carlson, Scott Hammond, Diane Carlson
Team 31: **Haxtun Junior High School,** Haxtun, CO., Coach: Jim Matthews
Team Members: Stacy Riles, Cindy Klassen, J.D. Holcomb
Team 33: **Nevin Platt Middle School,** Boulder, CO., Coach: Lee Wadleigh
Team Members: Hector Urroz, Matthew Reese, Josh Brant, Matthew Aguero
Solar Car Name: Wolf Mobile
Team 34: **Sinclair Middle School,** Englewood, CO., Coach: Carolyn Rudy
Team Members: Evan Rauen, Daniel Stoddard
Solar Car Name: The Recycler
Team 35: **West Jefferson Junior High School,** Conifer, CO., Coach: Mike Waldvogle
Team 37: **Deer Creek Middle School,** Littleton, CO., Coach: Lisa McGrath
Team Members: Robert Kausch, Steffan Becker, David Achten
Team 39: **Hayden Middle School,** Hayden, CO., Coach: Greg Richards
Team Members: Will Pedersen, Robert Leber, Derrick Goossens
Team 40: **Las Animas Middle School,** Las Animas, CO., Coach: Barbara Sharshel
Team Members: Nicholas Schwind, Justin Jurgens, David Critchfiled, Christoher Medina
Solar Car Name: Las Animas
Team 41: **Northglenn Junior High School,** Northglenn, CO., Coach: Steve Slater
Team Members: Michelle McGuirk, Julie Regher
Team 42: **Southern Hills Middle School,** Boulder, CO., Coach: Ben Boyer
Team Members: Patrick Hopper, Mike Ballbach, Peter Siewert, Alex Zieroth
Solar Car Name: The Solar Flare
Team 43: **Westview Middle School,** Longmont, CO., Coach: Larry Kilgore
Team 45: **Divine Redemmer,** Colorado Springs, CO., Coach, Pam Cobb
Team Members: Joe Peters, Orion Hartman, Justin Newport
Solar Car Name: Havarti
Team 48: **Lousiville Middle School,** Louisville, CO., Coach: Lars Peterson
Team Members: Aaron Bacon, Ben Bengerink, Sean Griffith
Team 49: **Ouray Middle School,** Ouray, CO., Coach: Eric Fagrelius
Team 50: **Aurora Hills Middle School,** Aurora, CO., Coach: Robert Berlinski
Team Member: Brandon Roberts
Team 51: **Wheat Ridge Middle School,** Wheat Ridge, CO., Coach: Cynthia Wilbur
Team Members: Jason Garner, Mike Creazzo, David Boulter, Nathan VanVorst
Solar Car Name: Lightning Racer
Team 52: **Central Lakewood ADT,** Lakewood, CO., Coach: Richard O'Connell
Team 53: **Faith Christian Academy,** Arvada, CO., Coach: Richard Miller
Team Members: Jonathan Coors, George Dunwoody, Reuben LaGuardi, Joshua Stephens
Team 54: **Community Christian School,** Cortex, CO., Coach: Michael Thornton
Team 55: **North Middle School,** Aurora, CO., Coach: Ken Cressy
Team 56: **Cresthill Middle School,** Highlands Ranch, CO., Coach: Joe Mikkelson
Team Members: Alex Olson, Jennifer Hageman, Rebecca Eley, Jeffrey Berger
Solar Car Name: Thin Racer

1994 JUNIOR SOLAR SPRINT RACE RULES AND VEHICLE SPECIFICATIONS

The object of the 1994 Junior Solar Sprint competition is to design and build a vehicle that will complete a race in the shortest possible time using the available power.

Teams are given a kit containing a solar panel and a motor. Using any other materials, competitors will design and build a solar powered vehicle that will race on a 20 meter race course. The winner of the competition will be the team whose vehicle is the top finisher in a series of head-to-head elimination rounds.

This year's solar kits are from a new manufacturer and solar panels from previous years may not be used in competition. Good luck!

MATERIALS

1. The motor and solar panel must be used without any modification.

2. The remainder of the vehicle can be made from any other material(s).

VEHICLE SPECIFICATIONS:

1. The vehicle must be safe to contestants and spectators, e.g., no sharp edges, projectiles, etc.

2. The vehicle may not be larger than 30 cm wide by 60 cm long by 30 cm high.

3. Decals of sponsor organizations (provided by JSS) must be clearly displayed on the sides or top of the vehicle. A 3 cm by 3 cm space must be left for the assigned car number.

4. The sun's light is the only energy source that may be used to power the vehicle. No other batteries or energy storage devices, e.g., flywheels are permitted.

5. Any energy-enhancing devices, like mirrors, must be attached to the vehicle.

6. The vehicle must be steered by the guide wire using one or more eyelets affixed tot the vehicle. Suggested eyelets were provided in the "Getting Started" packet. The vehicle must be easily removable from the guide wire, without disconnecting the guide wire.

7. The body of the car must be three dimensional. Teams will NOT be allowed to bolt the axles and the wheels to the solar cell. The solar cell cannot be used as the body of the car.

TRACK SPECIFICATIONS:

1. The length of the race course is 20 meters over flat terrain.

2. Race lanes are at least 60 cm. wide.

3. The guide wire will be located in the center of the track and will not be more than 1.5 cm above the track surface.

4. The track is a hard, flat, smooth surface such as a tennis court or a running track. A large sheet of rolled material, i.e., plastic, heavy paper, or roll roofing (half-lap) or hardwood taped or bolted together may be used to cover an unsuitable surface.

CONDUCT OF THE RACE:

1. At race time, the vehicle will be placed behind the starting line with all its wheels in contact with the ground and an opaque sheet covering, but not touching the solar panel. The opaque sheet will be removed at the start of the race, allowing the vehicle to collect solar power and start driving.

2. An early or push start may result in disqualification or a re-run of the heat, at the discretion of the official.

3. All vehicles will be started when the official signal is given. The winner of the heat will be the first vehicle to cross the finish line.

4. During the initial heats, the judges may declare multiple wins or losses.

5. One team member must wait at the finish line to catch the vehicle.

6. Team members may no accompany or touch the vehicle on the track. Vehicles stalled on the track may be retrieved after the end of the race has been declared.

7. The vehicle and team member must remain at the finish line until the order of the race has been established.

8. Lane changing or crossing will result in disqualification.

AWARDS:

1. The top performing car from each individual school will advance to the designated host sites competition. The car may be selected by time trials, intramural races, or at the discretion of the teacher/principal.

2. Awards will be given for the five fastest cars and for the five best design vehicles including technical merit, craftsmanship and innovation.

PLANNING COMMITTEE

The Planning Committee would like to especially thank all of the volunteers for encouraging, motivating and challenging Colorado's students to pursue interests in math, science, technology and engineering.

The Junior Solar Sprint Competition is successful because of the efforts of people like you.

Jeff Alleman
Julie Baxes
Jodi Donley
Jamey Evans
Mark Fitzgerald
Dave Ginley
Barbara Hill
Ed Hoo
Gloria Kratz
Linda Lung
Bill Marion
Ronda Neptune
Chris Powers
Mary Ross
Linda Ruff
Steve Rummel
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Denver, CO

Holidome/Holiday West
Golden, CO

Stevinson Automotive Group
Golden, CO

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Denver, CO

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Boulder, CO

American Solar Energy Society
Boulder, CO

Colorado State University
Engineering Department
Fort Collins, CO

Leroy Troxel - Photographer

Dave Parsons - Photographer

Billy Thompson - Former Denver Bronco

Sample Volunteer Training Materials

The 1994 Junior Solar Sprint
by DOE and NREL

Race Rules, Instructions and Schedules for Judges, Monitors and Runners

by Linda Ruff

Track Coordinator: Linda Ruff
(Committee Member)

Judges:
Doug Arent (Lead)
Dereck Willis (Assistant Lead)
Rafael Nieves
Mark Maestas
Shan Ring
Greg Baxes
Jamey Evans
Deb Amidandeau
Pat Dippo

Monitors:
Keith Steel (Lead Monitor**)**
Alan Ruff (Assistant Lead)
Sandy Steele
Ed Muljadi
Randy Combs
Ernie Oster
Phil Parilla
Kevin Gill
Phyllis Baines
Kyle Montgomery

Practice Track:
Lorie Niles
Brad Thacker
Fay Hoover (Lead/Monitor alternate)
Amy Ginley

Youth Volunteer Runners:
Randy Combs
Chris Combs
Ben Ross
Kwanza Steele
Morgan Steele

Track-Side Staging Board:
Leslie Hebb
Tiffany Ruff

Rules Committee:
Steve Rummel (Committee Member)
Jamey Evans (Committee Member)

See the attached schedule for your meeting time and work schedule on May 14th.

The heart of the event is the race, and it must run smoothly. It's important that the judges know the information on this page, and the next page thoroughly. The monitors need to understand the steps of the race, and their rolls in enforcing the track monitoring. The four steps of the race are detailed below, followed by more specifics and dispute information.

STAGE:

- The Lead Judge will call for a heat to "STAGE"
- The students will bring their cars to the start
  - **one student at the start**
  - **one at the track finish line to catch the car**
- The Judges will check each car at the start line to
  - **inspection sticker**
  - **car number**
- The Judge will indicate any "no shows" on the heat card

START

- All spectators will be moved back and the announcement is made that the heat is about to start.
- Each student will set their cars behind the start line, turn on the motor and shield the sun from the car's solar panel by using the "cover", provided by NREL.
- The Lead Judge will signal the start, the students remove the cover over their car, and the race begins. If a car can not get going on it's own, it will be permissible to let the student **gently** push the car to start the momentum.

RACE

- Students that are racing cars, are not to leave their position at the start, or end, of the track during the race, even if their car has become hung up on the wire or has stopped during the race. Judges and Monitors are to assist moving cars along the track.
- Judges are not to be distracted. They are required to watch every race thoroughly. ANYONE interfering with a judge or the judge's eye contact with the race should be told (by the judge or monitor) to leave or stay stand back during the race.

FINISH

- At the end of each race the judges will agree on first and second place finishers.
- The Judge will acknowledge/announce the first and second winners, so as to avoid disputes later.
- The Lead Judge will indicate **first, second and third** place winners on the head card.
- The Judge will give the heat card to the designated "RUNNER" to take the card to timing.
- Should their be a dispute see below.
- The Judges will begin staging for the next heat.

SPECIFICS

- Approximately 60 schools will each have a car to race.
- The cars have been divided up into "heats" where 10 cars will run one race at a time.

- The track will be ten "side-by-side" lanes, 20 meters long, grouped into pairs, with each pair of lanes 4 feet wide.
- There should be one start judge and three finish line judges during the race.
- **Cars must have passed inspection prior to racing** their first heat.
- Cars may go through design competition after the race, but are encouraged to complete this prior to the race, primarily in case of potential damage to the car.
- The Lead Judge will be provided a heat card with all cars indicated on it for each heat.
- Competition is by process of elimination. The first and second place winners will continue on the winner's side of the ladder and the eight losers continue on the other side.
- A car is eliminated when it has two losses. It's possible that a few cars won't have two losses before the final heat, but when the final race is run, the race is formally over.
- A loss can occur by losing a heat -or- by not racing the designated heat.

  Note - If a scheduled car is not on the start line when a Judge signals the heat to start it is a loss. It is the responsibility of the students to be aware of when they are scheduled to run and be on time.

DISPUTES

Should there be a dispute, the Lead Judge should briefly address the dispute with parties making the protest and the other judges at the time of the dispute. If it is not easily resolved it should be refereed to the Steve or Jamey on the rules committee, as soon as possible.

Inspection and Design Judging of the 1993 Sprint

JUDGES

Be as fair as possible. Do not be afraid to call a false start and restage the heat, if needed.

Discourage any interruptions to your duties, because distractions will cause a delay in the event. Don't become a bottleneck trying to answer questions and help people. Refer people to the committee chairmen, registration or other volunteers.

Any challenge to the results of a race, or to a car's legitimacy, should be registered as a protest to the Rules Committee, by the protesting school. Do not try to defend your call or judgement to parents or children, but, refer them to the committee.

TRACK MONITORS

You are the track and race event guards.
Keep all people off the track and outside designated area.

- Only children competing in a heat should be at the track's start and end.
- Adults should not be racing cars.
- One child can start the car and one can catch the car at the finish.
- Do not let the children take the cars from the finish line until the Lead Judge indicates he has the winners notated.
- Make sure that the Judges have a clear visual perspective of the entire race to insure fairness.
- No one should be between tracks at any time. The only exception to this, will be the track monitors, or an official event photographer or videographer who does not interfere with the race and the judge's view of all lanes.

PRACTICE TRACK

The practice track is for students, with cars in the event, to practice. Priority should be given to students with serious functional problems, or those needing to test before their race.

RUNNERS

The runner works for the Lead Judge. The main job of the Runner is to carry the heat cards to "timing" with the heat results. They may be asked to go and get something or someone during the race, if the judge needs something. Otherwise **the runner should stay at their post**, close to the lead judge while on duty.

The runner will be given a heat card by the lead judge at the end of a heat. The runner should take the heat card to the timing area immediately. No one else should touch the heat card.

1994 Junior Solar Sprint Volunteer Schedule for Judges and Monitors

Judges, Monitors and Runners on the day of the event:

•Check in at registration by 9:00 a.m., please
•Pick up your T-shirt and meal ticket for lunch
•**9:45 a.m. meeting** at the track, in the parking lot of the SERF building (see map)
•The race is scheduled to start at 11:00 with trophy ceremony about 2:30.
However, to allow for clouds or other delays our schedule extends beyond the posted race times.

INCLUDE A SCHEDULE OF EVENTS AND VOLUNTEERS

Sample Heat Card

NEVIN PLATT MIDDLE SCHOOL A CAR # 45			
HEAT	**LANE**	**W**	**L**
6	G	1	
12	F	3rd	
15	D		√

THIS IS YOUR HEAT CARD

1. When your heat is called, give this card to the starting line judge.

2. Shortly after the heat, you may pick up your card at the scorekeeper's table with your next heat and lane assignment recorded on it.